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Agricultural Experiment Station

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Alabama Polytechnic Institute

AUBURN

HEADING OFF BOLL WEEVIL PANIC

REVISED

BY

W. E. HINDS,

Entomologist

Opelika, Ala.
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*In cooperation with United States Department of Agriculture.

Heading Off Boll Weevil Panic

By W. E. Hinds, Entomologist.

The boll weevil entered Alabama during the fall of 1910 and in that season infested, wholly or partly, five counties. In the area that year infested, was grown less than 15,000 bales in 1910. During the seasons of 1911 and 1912 the pest advanced until twenty-six counties are now included within or crossed by, the line of infestation. The weevil spread now reaches into territory where cotton is grown extensively. Fully 465,000 bales were grown in 1911 within the area now infested in Alabama. Four-fifths of this was produced in the area first reached by the weevils in 1912. This entire area usually produces 2-5 of our state crop.

EFFECTS OF WEEVIL OCCURRENCE ON COTTON PRODUCTION.

Many people in Alabama have made the mistake of thinking that because the Texas cotton crop during recent years has not greatly decreased the boll weevil has ceased to be an important factor. It is a serious mistake to think that Texas and Alabama conditions are comparable. It is true that the boll weevil has done less damage in Texas for several years past than it did up to 1907. The explanation for this is really very simple. This partial control is due to a series of exceptionally hot, dry summers and exceptionally severe winters. In a large area in western Texas in 1911 the rainfall during May and June amounted to hardly 1 1-3 inches for the two months. In this area the weevils were exterminated. Such drouth has never been recorded in Alabama and is never likely to occur. On many occasions during the past five years, Weather Bureau stations in Texas have recorded temperatures of from 105° to 116°. Such extreme heat also is unknown to us. In addition to these facts the area of cotton culture in Tex-

as has been greatly extended and this has helped to keep up the total crop of that state.

We can, however, gain a fair idea of what we may expect from the boll weevil in Alabama by studying the effects in Mississippi where rainfall and temperature conditions in summer and winter are most nearly like those prevailing in Alabama.

In Mississippi possibly the greatest loss sustained in any county was that of Adams county producing nearly 24,000 bales in 1906 and 1,062 in 1910. Unquestionably it will take such counties many years to even recover the ground which they lost largely because they failed to organize their fight so as to hold their laborers.

In the seven southwestern counties of Mississippi first infested in 1907 and 1908, the crop in 1906 was 158,578 bales but in 1910 only 24,014 bales or about 15.14 per cent. of their normal crop. The next twelve counties to be infested partly in 1908 but mostly in 1909 had their crop cut from 214,115 bales in 1906 to 135,457 in 1910 the first year after general infestation occurred. This was a loss of more than 35 per cent. of their normal crop. Taking together the twenty-two Mississippi counties brought wholly within the weevil area during 1907-9, we find the cotton yield decreased from 451,612 bales in 1906 to 235,241 bales in 1910. This is but 52 per cent. of the 1906 crop which was close to the average. Comparing this tremendous reduction within the infested area with conditions in a total of 53 counties not touched by the line of 1909, we find that their combined yield was 987,527 bales in 1906 and 964,542 bales in 1910. In general then it appears that the normal 1910 crop, regardless of weevil influence, should have been about 2.4 per cent. short of that of 1906. Even with this allowance for a less favorable season, it appears that the weevils directly and indirectly cut the crop just in half in Mississippi territory infested from one to three years.

It is time therefore, for a definite, concerted movement here in Alabama which may help to prevent such losses as have occurred in Mississippi, Louisiana and other infested

states. In some parts of these states the losses have been enormous. For instance, in Louisiana, the cotton crop in 1910 was but approximately 25 per cent. of the crop of 1906 when the weevil had but recently entered the state. In some parishes in Louisiana, as for instance the two raising the largest quantity of cotton, St. Landry produced in 1906 about 69,000 bales but in 1910 only 15,000 bales. Caddo parish produced in 1906 nearly 54,000 bales and in 1910, less than 21,000 bales.

A broader and more general view of the weevil effect in decreasing cotton yields may be had by studying the figures for several states during a series of years, showing average yields before and after infestation occurred.

TABLE 1.
Influence of Boll Weevil on Cotton Yield Per Acre.

		1894	Bales per acre	1898	Bales per acre	1902	Bales per acre
Alabama	*A	2,664,861		3,003,176		3,501,614	
	†Y	900,439	.337	1,176,042	.391	997,045	.279
Mississippi	A	2,826,272		2,900,298		3,183,989	
	Y	1,231,227	.435	1,247,128	.429	1,451,750	.455
Louisiana	A	1,313,296		1,281,691		1,617,586	
	Y	760,757	.579	717,749	.560	886,365	.548
Texas	A	6,854,621		6,991,904		7,640,351	
	Y	3,140,392	.458	3,363,109	.481	2,491,394	.326

		1906	Bales per acre	1909	Bales per acre	1910	Bales per acre
Alabama	*A	3,658,000		3,471,000		3,560,000	
	†Y	1,263,674	.345	1,065,377	.307	1,221,225	.343
Mississippi	A	3 408,000		3,291,000		3,317,000	
	Y	1,521,491	.446	1,109,580	.337	1,254,419	.377
Lousiana	A	1.739,000		930,000		975,000	
	Y	979,270	.563	269,573	.290	256,375	.263
Texas	A	8,894,000		9,660,000		10,060,000	
	Y	4,066,472	.457	2,554,520	.264	3,072,932	.305

*A. Represents the acreage in cotton.
†Y. Refers to yield.

TABLE 2.
Effect of Weevil Infestation on Cotton Yield Per Acre.

		1894	1898	1902	1906	1909	1910
Ala.	*A	0.327	0.397	0.279	0.345	0.307	0.343
	†B	None	None	None	None	None	None
Miss	A	0.435	0.429	0.455	0.446	0.337	0.377
	B	None	None	None	None	9-10 p. ct.	14 p. ct.
La.	A	0.579	0.560	0.548	0.563	0.290	0.263
	B	None	None	None	23 p. ct.	100 p. ct.	100 p. ct.
Tex.	A	0.458	0.481	0.326	0.457	0.264	0.305
	B	¼ of 1 p.ct.	11 p. ct.	36-33 p.ct.	70-72 p.ct.	78-82 p.ct.	80-84 p.ct.

*A. Refers to portion of bale per acre.
†B. Approximate percentage of state acreage under weevil infestation.

A few general statements relative to some of the figures given above may help still further toward the formation of a proper idea of their significance. The five years selected are representative of conditions existing at intervals from the time when there was practically no infestation (1894) to the time of the most recent complete figures now available (1910). Yields per acre by states can be determined very closely from figures of state yields published annually by the U. S. Census Bureau. But these reports do not give acreage by counties for each year and we therefore find it impossible to determine and compare acreage yields in counties in the infested area for each year with yields in other counties outside the weevil line. As Lousiana is the only state yet completely infested, that is the only case where the decreased yield actually occurring in the infested area is not raised by combination with figures from other counties in the state where there is no infestation. Extreme drought has also seriously affected Texas especially in 1909 and 1910.

From a close study of the foregoing statements and of the tables, it would appear that we may reasonably expect the boll weevil not only to cause a considerable reduction in the acreage devoted to cotton in the infested area but also to cause a decrease of between 25 and 50 per cent. in the average yield per acre obtainable under conditions of infestation. When we consider further that the average yield in Alabama for the six representative years considered above is but little more than three-fourths of the average yield in the other three states taken together, I believe it will be very evident to all that some change is absolutely essential in Alabama in the direction of securing immediate diversification of crops and other changes in our agricultural and economic systems if we shall be successful in preventing large loss from the boll weevil.

Much of the tremendous loss might have been prevented had the people of these sections been ready to adopt certain changes in their agricultural methods which have been shown necessary in all sections where the weevil has gone. It is well known that the weevil has everywhere forced the raising of a greater variety of crops, some reduction in the cotton acreage to be worked by each mule and some change in the advance system under which most of the cotton crop has heretofore been grown. It has usually required from three to five years for these necessary changes to become generally adopted and invariably there-

after greater prosperity has resulted than was experienced before the advent of the weevil.

It is evident, therefore, that the first few years under weevil conditions constitute the critical period in the fight against this pest. During this period there has existed in most localities a more or less well-defined business panic with failures of merchants, reduction of crops, curtailment of advances, the moving of tenant labor and frequently a considerable depreciation in real estate values. All this can be clearly shown to result from the policy of delaying the adoption of the changes which the boll weevil situation everywhere requires until after the loss of several crops has finally forced their adoption. The results of the work done with the U. S. farm demonstration agents have shown conclusively that it is possible by using proper methods to so control the weevil that cotton yields may be fully maintained. Every effort must be made to further the general adoption of such successful methods of cotton culture both within and without the weevil-infested aea.

Clearly then, much of the loss might be prevented wherever these changes could be brought about in advance of the abundant occurrence of the weevil. Alabama should profit by the sad experience of neighboring infested states and avoid these losses and the consequent decrease of our agricultural prosperity.

AGENCIES CO-OPERATING IN WEEVIL FIGHT IN ALABAMA.

In Alabama there are three principal co-operating agencies engaged in this fight against the boll weevil. These, in the order of their establishment, are as follows:

The first agency, the State Department of Agriculture and Industries now under the direction of Commissioner R. F. Kolb was organized in 1883, and has conducted principally an educational work in the interest of the agricultural development of the State. The Commissioner of Agriculture and Industries is ex-officio, Chairman of the Alabama State Board of Horticulture which is charged with the administration of the State boll weevil quarantine regulations.

The Alabama Experiment Station located in Auburn, established in 1888, is the second agency. This station, now under the direction of Prof. J. F. Duggar, has done a work of immeasurable value in its investigations and in its

general work of educating the farmers in the use of more advanced and successful agricultural methods. As a branch of this Station, the Department of Entomology was organized in 1905. The writer became Entomologist in the fall of 1907, after having spent his entire time summer and winter for five and one-third years in the constant study of the life and control of the boll weevil in Texas and Lousiana under the U. S. Bureau of Entomology.

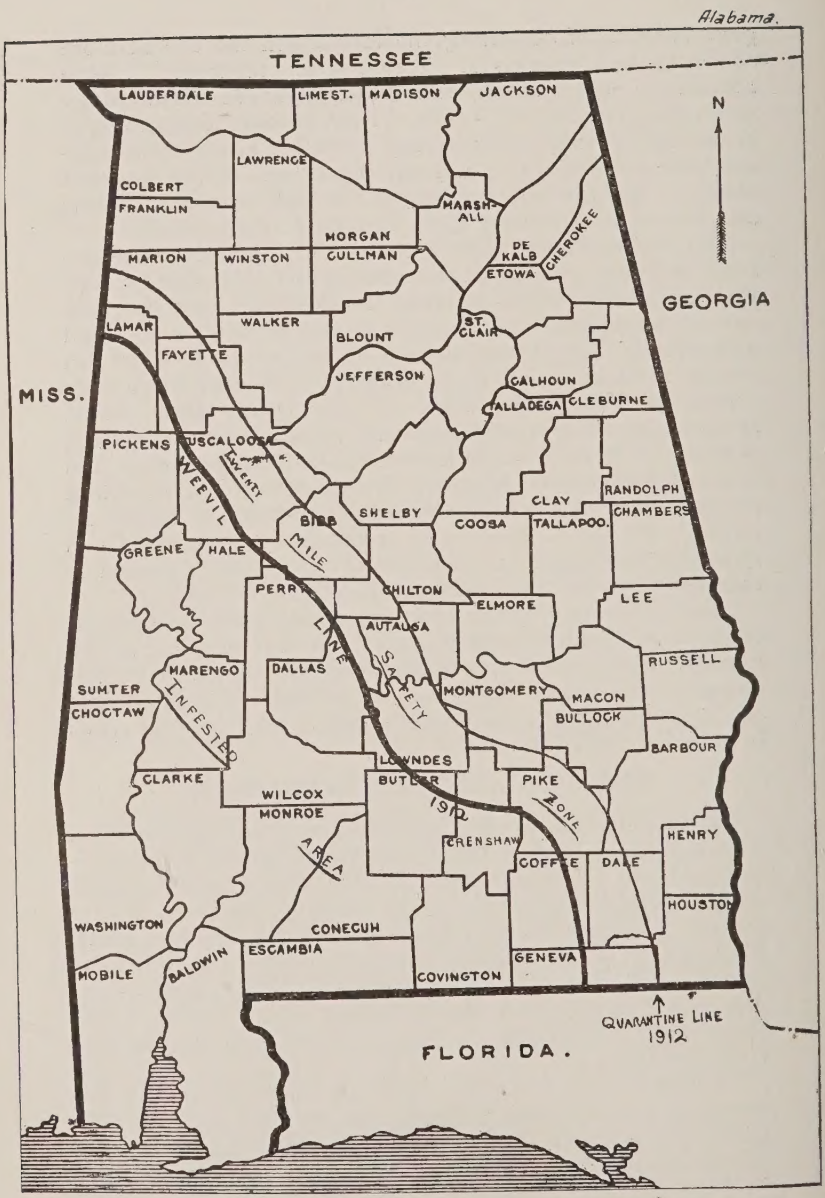
The third agency, The Farmers' Co-operative Demonstration Work is a direct outcome of the campaign against the boll weevil. This, starting in 1904 in Texas, has now spread throughout the South and is becoming a national movement. The Alabama part of this work, now in charge of State Agent B. L. Moss, is said to be more fully organized than is the work of any other state. This agency, gathering up the best that is known about fighting the weevil, seeks to make known to the average farmer and to secure the general adoption by him of better agricultural methods. In this work remarkable success is being attained. Mr. B. L. Moss was engaged in the boll weevil fight in Mississippi for three years before being placed in charge of the work in Alabama over two years ago.

From our study of the boll weevil and from our knowledge of Alabama conditions, we are convinced that the general adoption of the suggestions to be given in this communication will aid greatly in preventing a large part of the losses in this state which otherwise the boll weevil is bound to inflict.

THE BOLL WEEVIL SITUATION.

Let us state the present situation as plainly as possible. Through the spread of the weevil to the middle of November 1912, the following counties in Alabama were brought wholly within the infested area: Mobile, Baldwin, Washington, Clarke, Choctaw, Sumter, Pickens, Greene, Hale, Marengo, Wilcox, Monroe, Conecuh, Escambia, and Covington, while the weevil line crosses through Lamar, Fayette and Tuscaloosa; includes nearly all of Butler, Crenshaw and Coffee counties, a corner of Pike and half of Geneva county.

The area newly infested in 1911 produces more than five times as much cotton as does that reached first in 1910, while the advance of the weevil in 1912 affects territory producing more than four times the crop touched by them in 1910 and 1911 combined. Wherever the weevil once reaches in Alabama it is practically certain to remain and



ALABAMA WEEVIL LINE OF 1912 AND QUARANTINED AREA

to be a factor which must thereafter always be considered in the production of cotton.

This is not a passing problem. The weevil attacks nothing but cotton. It can be fairly well controlled and the profitable production of cotton continued by the adoption of various changes in the method of raising the crop so that injury by the weevils may be very largely reduced or avoided. The effectiveness of these changes has been so abundantly demonstrated as to be now established beyond all reasonable question.

Loss by the boll weevil occurs particularly in two ways. First, by the actual destruction of cotton squares and bolls which occurs wherever weevils exist and about in proportion to the number of weevils produced, especially during the period before the maturity of the crop. This loss may vary from a small percentage to the complete destruction of the crop. Where the best methods of raising cotton are used it may be reduced to a common average of between five and ten per cent. of the crop which might be secured with the same methods but without weevils. Where no attention is paid to these improved methods, the loss averages between twenty-five and fifty per cent. of the usual crop obtainable without the weevil. Under nearly all conditions of soil and climate it is certain that the careless farmers will suffer more heavily from boll weevil infestation than will the best farmers in the same location.

The greatest problem today is not how to fight the boll weevil sucessfully, but rather how to secure the general adoption by the average farmer and in advace of serious weevil infestation, of those measures and methods in the culture of cotton and other crops which have been found in the experience of the best farmers in several states and throughout the infested area to be effective and profitable in fighting the weevil, reducing injury by that pest to a minimum and making the user of these ideas more sucessful and prosperous in spite of the presence of the weevil than he ever was before its occurrence. The real objective in all this campaign is not to secure the raising of more bales of cotton annually, but rather to secure the greater prosperity and happiness of all those engaged in any degree in cotton cultivation and through them to secure the prosperity of all business interests, especially in this Southland.

The second and greatest damage done by the weevil does not result usually from its destruction of cotton directly but rather through the condition of "panic" which

has usually followed during the first few years of weevil occurrence in any locality. In extreme cases this "panic" has bankrupted bankers and merchants, ruined large planters, paralyzed all business activity and driven tenants and movable laborers out of the locality.

We all know the feeling of "panic" is extremely contagious and that its prevalence only makes loss the greater and more certain in any emergency. It seems very certain that the attitude of leading men in any community will determine the attitude of the crowd that is accustomed to follow or depend upon them. A feeling of "panic" among bankers, merchants and large planters is sure to spread quickly and widely among small farmers and tenants. We believe that such a panic can be prevented almost entirely by timely, intelligent, and unselfish co-operative action on the part of these leading men. Such action we are striving to secure for Alabama in the present crisis and to that end we ask careful consideration of every suggestion which may promise effective help in this time of serious need.

SUGGESTIONS FOR MORE EFFECTIVE WEEVIL FIGHT.

Plan for bankers, cotton factors, merchants and others relative to loans or advances to cotton planters secured by real estate, crops or other farm products.

1. General Considerations.

The calling in of existing loans or refusal to make any new ones on account of boll weevil occurence would be a first step in starting the "panic" which we are seeking to avoid. Tenants who have been receiving heavy advances must doubtless still be helped to some extent or they will simply be forced to move—again starting "panic." Upon the increase in agricultural prosperity generally, depends very largely the prosperity of a majority of all business interests in Alabama.

Therefore, it appears to be the part of sound business policy for bankers, cotton factors, merchants and farmers to stand shoulder to shoulder in this fight for mutual help and protection, each doing his part intelligently, courageously, and unselfishly. With such co-operation the readjustment necessary to meet new conditions can most easily be made, losses will be minimized and victory in the fight against the boll weevil will be certain. The black can and must be directed and helped by the more intelligent white for the common good of both races.

The announcement of the general adoption of a carefully considered plan for dealing with the situation will go far toward removing the danger of "panic" and aid greatly in securing the immediate adoption of the changes necessary to successfully meet the boll weevil conditions. Any feasible plan must be sufficiently elastic to be readily adaptable to the needs of various localities in the State. It should be designed to make the farmer generally independent of advances as quickly as may be possible and to aid in retaining tenants and laborers on our farms throughout the State. If adopted and adhered to by a majority of business men, the most powerful lever available—the financial—may thus be made to aid in meeting successfully the boll weevil crisis.

2. The Plan.

A. For their own protection bankers, merchants and others making what we may call agricultural loans, should understand and agree among themselves that they will continue to make such loans in boll weevil territory, as a rule, only in accordance with a general policy of requiring an agreement on the part of the borrower to adopt such practices as will make their investment safe, and secure also the ultimate good of their client. As a general thing if such an agreement is adhered to these loans may continue to be made safely in most cases to the limit of from 50 to 75 per cent. of what might be advanced otherwise if the boll weevil were not present. Loans to croppers should not be made so small as to force them to move elsewhere or as to cripple them in their work of making a crop. The aim should be to provide such help as may be absolutely essential to their stay and their success, while at the same time encouraging them to become independent of such aid and finally cash paying citizens.

B. As a rule such loans should be made conditonal upon the borrower reducing his cotton acreage so that it may be possible for him to give it the best of care. This is essential to success under boll weevil conditions and will certainly result in greatest profit even without the weevil. This will allow him also to raise more food stuffs and to adopt some reasonable and profitable diversification and rotation of crops. These points should be strenuously insisted upon in most cases.

C. We believe that some arrangement can safely be made, and should be made, so that other crops than cotton may be considered as acceptable security for such loans.

The raising of more live stock should also be encouraged in most cases.

D. We believe that leases for longer terms than one year should be encouraged with such provisions as will make it to the advantage of the tenant to improve the property and to remain thereon indefinitely. In most cases it would doubtless help if the notes could be made "payable on or before December 15th," so that cotton especially may be held to avoid the breaking of the market that occurs every year as the mortgaged cotton is rushed to sale at whatever price may be offered.

E. To meet the needs in various sections of the State it would probably be best to provide Advisory Committees for at least county units to consider local conditions and arrange a program for general county following. In preparing such a program it would seem that a county committee might be provided upon which should be representatives of the Farmer's Co-operative Demonstration Work (possibly by the local county Demonstration Agent), of the business interests and also of the farmers. After duly discussing the local problems and considering fully the factors which might aid in the fight throughout their county, the conclusions of these representative men might be widely published so as to become well known throughout that county. These conclusions might then serve as a general guide for that section indicating what lenders might safely allow and reasonably require in each locality. Such agitation of the subject would certainly be exceedingly helpful and go far toward the moulding of a sound and progressive public opinion. The committee could also conduct such special meetings as might be arranged. A series of "beat meetings," conducted by some of the most successful local men would command an attention and lead to action by tenants who do not read that can hardly be attained in any other way.

F. The fact that various business interests propose to adopt and support this general plan of action should then be widely published so that the attitude of the leaders in the movement might be known not only among other business men, but more generally also among the men actually engaged in farm work. Possibly action along this line might be taken officially by business men's organizations and it should certainly be taken by all parties willing to co-operate for their common welfare.

At some points in Mississippi, Produce Exchanges have been organized with very helpful results. These exchan-

ges are formed by local merchants who agree among themselves to take every kind of produce that the farmers may offer, paying therefor the highest market prices. This plan is a strong help in persuading farmers to diversify crops. The only really effective way to secure voluntary reduction of cotton acreage is to prove to the farmer that there are many other things that he can produce more profitably than cotton at 8 to 10 cents. It is very important that the farmer be shown that something besides cotton can be made to pay his bills. There should, for example, be provisions for taking the farmer's corn in the ear and converting it into sacked corn for which there is a market. Co-operative selling may also lead to greatly increased profits on many crops.

G. Of course, it is not intended to propose any stereotyped plan of action. The case of each applicant for a loan must be considered by itself with due consideration of both local conditions and personal characteristics. It is possible, however, to do this and still make in each case an intentional effort to accomplish the purpose heretofore mentioned.

The adoption of this plan by any party is nothing more than an expression of his intention in making future agricultural loans or "advances" to be guided by the general principles herein set forth and by those recommended by the county committee. The purpose is to promote the immediate and general adoption of a more diversified agriculture and the practice of as many as possible of those methods in the culture of cotton which have elsewhere proven most effective in reducing boll weevil injury thereto. The methods referred to are those which taken together constitute what is commonly known as the "cultural system of controlling the Mexican cotton boll weevil." The various steps in this system may be learned by any one through the County Farm Demonstration Agents or through the Alabama Experiment Station, located at Auburn.

H. Success in starting this movement immediately will depend upon someone taking the initiative in each county. Will YOU not see to it personally that the matter is considered at once in your community? If you are willing to help in this movement, do not fail to talk this matter over with your fellow citizens and see that action is taken for your county—

AT ONCE

New edition, revised, December, 1912.

THE FIRST NATIONAL BANK

Birmingham, Ala., Dec. 19, 1911.

Dr. W. E. Hinds, Ph. D.,
Entomologist to the Experiment Station.
Auburn, Ala.

My dear Sir:

I have carefully examined the advance proofs of your Bulletin No. 159, entitled "Heading off Boll Weevil Panic", and desire to state that your suggestions as to the course that should be pursued by the bankers, cotton growers and merchants meets with my hearty approval. It is essential that the farmers be given the usual financial assistance, but to secure it it is necessary for them to give the banks and merchants proper assurance that their interests will be safeguarded by common sense methods of fighting the boll weevil.

I am inclined, however, to doubt the wisdom of making the general settlement date later than December 1st, by having farmers' notes made "payable on or before December 15," as suggested in Section D of your plan. There has already been a tendency toward earlier crops, which will be accentuated by the coming of the boll weevil, and with their notes payable on December 1st the cotton growers will have September, October and November in which to exercise their discretion as to the marketing of cotton. It seems to me that December 1st would be about as late as would be practicable for general settlement, as there are many payments that must necessarily be made during the month of December.

With this exception, I heartily commend your plan to the banking fraternity of the State, believing that its general adoption will benefit the banking and other business interests of Alabama.

Yours very truly,
W. P. G. HARDING,
President.

DEPARTMENT OF AGRICULTURE AND INDUSTRIES
STATE OF ALABAMA
MONTGOMERY

Dec. 20, 1911.

Dr. W. E. Hinds, State Entomologist,
Auburn, Ala.

Dear Sir:

I have received copy of advance proof of your Bulletin No. 159, entitled "Heading Off Boll Weevil Panic," and I have read same very carefully and give it my unqualified endorsement.

We cannot doubt that changes which you suggest are bound to take place as a result of the boll weevil's advance within the next few years Experience in other states has shown this. I believe that the business interests of Alabama and our highest agricultural prosperity call for the immediate adoption of these changes.

You may count upon our hearty co-operation in bringing this to pass.

Yours truly,
R. F. KOLB,
Commissioner of Agriculture and Industries.